

IN THE CLAIMS:

Please amend Claims 1, 17, 22 and 27, and add new Claims 32-51, as follows.

1. (Currently Amended) An optical instrument, comprising:  
an optical element; and  
a detector for detecting ~~an impurity~~ a concentration of airborne impurities in  
an ambience of a space surrounding the optical element;  
ozone supplying means for supplying ozone into the ambience; and  
cleaning means for cleaning the ambience by use of the ozone supplied by  
said ozone supplying means, when the impurity concentration detected by said detector is  
not less than a predetermined value, to suppress deposition of the airborne impurities on  
the optical element.

2. (Canceled)

3. (Canceled)

4. (Canceled)

5. (Previously Presented) An optical instrument according to Claim 1, further comprising means for putting the ambience in a state purged with a gas substantially not absorbing light to be propagated through the optical element.

6. (Previously Presented) An optical instrument according to Claim 5, wherein the gas is nitrogen or helium.

7. (Previously Presented) An optical instrument according to Claim 5, wherein the light comprises deep ultraviolet rays having a wavelength not longer than 200 nm.

8. (Previously Presented) An optical instrument according to Claim 7, wherein the gas comprises a helium gas.

9. (Original) An optical instrument according to Claim 6, wherein the light comprises deep ultraviolet rays having a wavelength of about 248 nm.

10. (Canceled)

11. (Previously Presented) An optical instrument according to Claim 1, further comprising means for holding a mask, an illumination optical system for

illuminating a pattern of the mask with light from a light source, and means for holding a wafer to be exposed with the pattern of the mask.

12. (Previously Presented) An optical instrument according to Claim 11, wherein said optical element comprises a reflective element only, or combination of a reflective optical element and a refractive optical element.

13. (Previously Presented) An optical instrument according to Claim 1, wherein said detector has a sensor for detecting a concentration of an organic substance.

14. (Original) An optical instrument according to Claim 13, wherein the concentration of the organic substance is controlled so that the total amount of organic substance in a gas inside said optical instrument becomes not greater than  $1 \mu\text{g}/\text{m}^3$ .

15. (Original) An optical instrument according to Claim 14, wherein the concentration of the organic substance is controlled so that each concentration of carboxylic acids, aldehydes, esters, phenols, phthalates, phthalic acids, amines, and amides is kept at  $0.01 \mu\text{g}/\text{m}^3$  or less.

16. (Previously Presented) A device manufacturing method, comprising the steps of:

exposing a wafer by use of an optical instrument as recited in Claim 11; and

developing the exposed wafer.

17. (Currently Amended) An optical instrument, comprising:

a detector for detecting ~~an impurity~~ a concentration of airborne impurities in an ambience of a space surrounding an optical element;

oxygen supplying means for supplying oxygen into the ambience; and

cleaning means for cleaning the ambience by projecting light to the oxygen supplied by said oxygen supplying means, to produce ozone or active oxygen, when the impurity concentration detected by said detector is not less than a predetermined value, to suppress deposition of the airborne impurities on the optical element.

18. (Previously Presented) An optical instruction according to Claim 17, further comprising means for holding a mask, an illumination optical system for illuminating a pattern of the mask with light from a light source, and means for holding a wafer to be exposed with the pattern of the mask.

19. (Previously Presented) An optical instrument according to Claim 17, wherein said optical instrument includes a reflective optical element only, as said optical element.

20. (Previously Presented) An optical instrument according to Claim 17, wherein said optical instrument includes, as said optical element, a reflective optical element and a refractive optical element.

21. (Previously Presented) A device manufacturing method, comprising the steps of:  
  
exposing a wafer by use of an optical instrument as recited in Claim 17; and  
  
developing the exposed wafer.

22. (Currently Amended) An optical instrument, comprising:  
  
a detector for detecting ~~an impurity~~ a concentration of airborne impurities in an ambience of a space surrounding an optical element;  
  
light projecting means for projecting light into the ambience; and  
  
cleaning means for cleaning the ambience by generating a photochemical reaction in the ambience by projecting light thereto using said light projecting means, when the impurity concentration detected by said detector is not less than a predetermined value, to suppress deposition of the airborne impurities on the optical element.

23. (Previously Presented) An optical instrument according to Claim 22, further comprising means for holding a mask, an illumination optical system for illuminating a pattern of the mask with light from a light source, and means for holding a wafer to be exposed with the pattern of the mask.

24. (Previously Presented) An optical instrument according to Claim 22, wherein said optical instrument includes a reflective optical element only, as said optical element.

25. (Previously Presented) An optical instrument according to Claim 22, wherein said optical instrument includes, as said optical element, a reflective optical element and a refractive optical element.

26. (Previously Presented) A device manufacturing method, comprising the steps of:  
exposing a wafer by use of an optical instrument as recited in Claim 22; and  
developing the exposed wafer.

27. (Currently Amended) An optical instrument, comprising:  
a detector for detecting ~~an impurity~~ a concentration of airborne impurities in an ambience of a space surrounding an optical element; and  
cleaning means arranged to generate a photochemical reaction by use of a photo-catalyst, thereby to clean the ambience, when the impurity concentration detected by said detector is not less than a predetermined value, to suppress deposition of the airborne impurities on the optical element.

28. (Previously Presented) An optical instrument according to Claim 27, further comprising means for holding a mask, an illumination optical system for illuminating a pattern of the mask with light from a light source, and means for holding a wafer to be exposed with the pattern of the mask.

29. (Previously Presented) An optical instrument according to Claim 27, wherein said optical instrument includes a reflective optical element only, as said optical element.

30. (Previously Presented) An optical instrument according to Claim 27, wherein said optical instrument includes, as said optical element, a reflective optical element and a refractive optical element.

31. (Previously Presented) A device manufacturing method, comprising the steps of:

exposing a wafer by use of an optical instrument as recited in Claim 27; and  
developing the exposed wafer.

32. (New) An optical instrument according to Claim 1, wherein the detector continuously measures the impurity concentration during operation of the optical instrument.

33. (New) An optical instrument according to Claim 1, wherein the detector measures the impurity concentration during operation of the optical instrument.

34. (New) An optical instrument according to Claim 17, wherein the detector continuously measures the impurity concentration during operation of the optical instrument.

35. (New) An optical instrument according to Claim 17, wherein the detector measures the impurity concentration during operation of the optical instrument.

36. (New) An optical instrument according to Claim 22, wherein the detector continuously measures the impurity concentration during operation of the optical instrument.

37. (New) An optical instrument according to Claim 22, wherein the detector measures the impurity concentration during operation of the optical instrument.

38. (New) An optical instrument according to Claim 27, wherein the detector continuously measures the impurity concentration during operation of the optical instrument.



39. (New) An optical instrument according to Claim 27, wherein the detector measures the impurity concentration during operation of the optical instrument.

40. (New) An optical instrument, comprising:

an optical element;

a gas inlet port for introducing gas to the optical instrument;

a gas outlet port for exhausting gas from the optical instrument;

a first detector for detecting a concentration of airborne impurities in an ambience of a space surrounding the optical element, the first detector being positioned at the gas outlet port;

ozone supplying means for supplying ozone into the ambience through the gas inlet port; and

cleaning means for cleaning the ambience by use of the ozone supplied by the ozone supplying means, when the airborne impurity concentration detected by the first detector is not less than a predetermined value.

41. (New) An optical instrument according to Claim 40, further comprising a second detector for detecting a concentration of airborne impurities, the second detector being positioned at the gas inlet port,

wherein the cleaning means cleans the ambience by use of the ozone supplied by the ozone supplying means, when the airborne impurity concentration of the

ambience of a space surrounding the optical element detected by the first and second detectors is not less than a predetermined value.

42. (New) An optical instrument, comprising:

a gas inlet port for introducing gas to the optical instrument;

a gas outlet port for exhausting gas from the optical instrument;

a first detector for detecting a concentration of airborne impurities in an ambience of a space surrounding an optical element, the first detector being positioned at the gas outlet port;

oxygen supplying means for supplying oxygen into the ambience through the gas inlet port; and

cleaning means for cleaning the ambience by projecting light to the oxygen supplied by the oxygen supplying means, to produce ozone or active oxygen, when the impurity concentration detected by the first detector is not less than a predetermined value.

43. (New) An optical instrument according to Claim 42, further comprising a second detector for detecting a concentration of airborne impurities, the second detector being positioned at the gas inlet port,

wherein the cleaning means cleans the ambience by projecting light to the oxygen supplied by the oxygen supplying means, to produce ozone or active oxygen, when the airborne impurity concentration of the ambience of a space surrounding the optical element detected by the first and second detectors is not less than a predetermined value.

44. (New) An optical instrument, comprising:

- a gas inlet port for introducing gas to the optical instrument;
- a gas outlet port for exhausting gas from the optical instrument;
- a first detector for detecting a concentration of airborne impurities in an ambience of a space surrounding an optical element, the first detector being positioned at the gas outlet port;
- light projecting means for projecting light into the ambience; and
- cleaning means for cleaning the ambience by generating a photochemical reaction in the ambience by projecting light thereto using the light projecting means, when the impurity concentration detected by the first detector is not less than a predetermined value.

45. (New) An optical instrument according to Claim 44, further comprising a second detector for detecting a concentration of airborne impurities, the second detector being positioned at the gas inlet port,

wherein the cleaning means cleans the ambience by generating a photochemical reaction in the ambience by projecting light thereto using the light projecting means, when the airborne impurity concentration of the ambience of a space surrounding the optical element detected by the first and second detectors is not less than a predetermined value.

46. (New) An optical instrument, comprising:

- a gas inlet port for introducing gas to the optical instrument;
- a gas outlet port for exhausting gas from the optical instrument;
- a first detector for detecting a concentration of airborne impurities in an ambience of a space surrounding an optical element, the first detector being positioned at the gas outlet port; and

cleaning means arranged to generate a photochemical reaction by use of a photo-catalyst, thereby to clean the ambience, when the impurity concentration detected by the first detector is not less than a predetermined value.

47. (New) An optical instrument according to Claim 46, further comprising a second detector for detecting a concentration of airborne impurities, the second detector being positioned at the gas inlet port,

wherein the cleaning means cleans the ambience by use of a photo-catalyst, thereby to clean the ambience, when the airborne impurity concentration of the ambience of a space surrounding the optical element detected by the first and second detectors is not less than a predetermined value.

48. (New) A device manufacturing method, comprising the steps of:

- exposing a wafer by use of an optical instrument as recited in Claim 40; and
- developing the exposed wafer.

49. (New) A device manufacturing method, comprising the steps of:  
exposing a wafer by use of an optical instrument as recited in Claim 42; and  
developing the exposed wafer.

50. (New) A device manufacturing method, comprising the steps of:  
exposing a wafer by use of an optical instrument as recited in Claim 44; and  
developing the exposed wafer.

51. (New) A device manufacturing method, comprising the steps of:  
exposing a wafer by use of an optical instrument as recited in Claim 46; and  
developing the exposed wafer.